The following pictures show the tests that I did with three ST1 detectors bump bonded to FPIX1 chips. All the tests were performed in a time window smaller then 1 hour, so it's unlikely that the temperature factor would be important in the comparison between detectors.

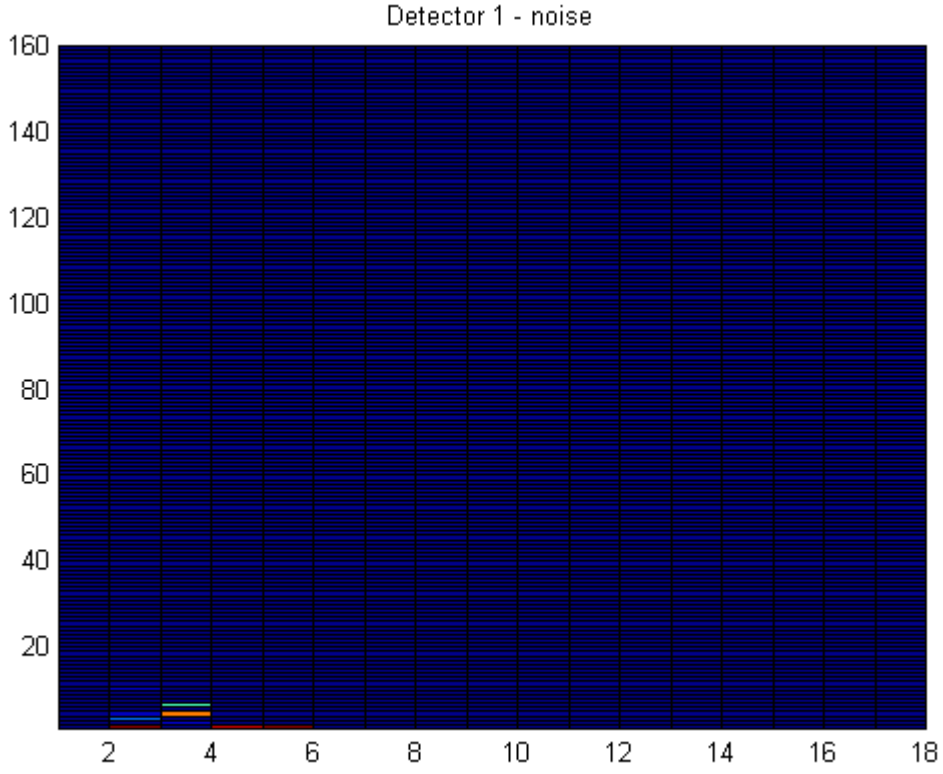
Test conditions:

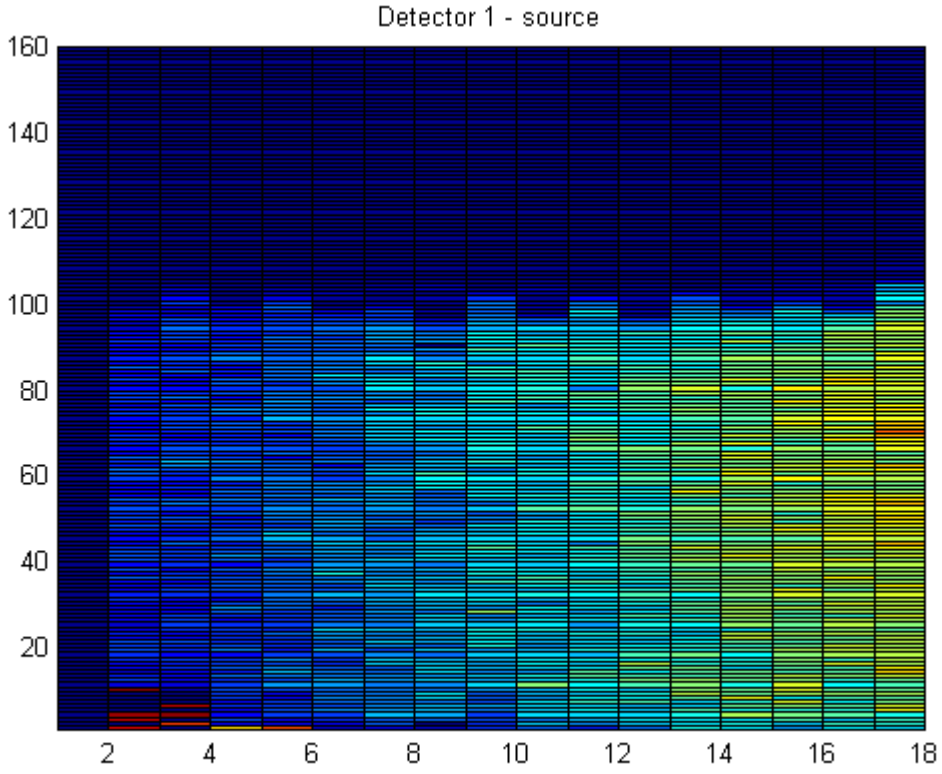
- Threshold: Vth0 = 2.05V
- High voltage bias: Vb = -75V
- Bias current :
    - Detector 1 : -18.2nA;
    - Detector 2 : -23nA
    - Detector 4 : -45.2nA

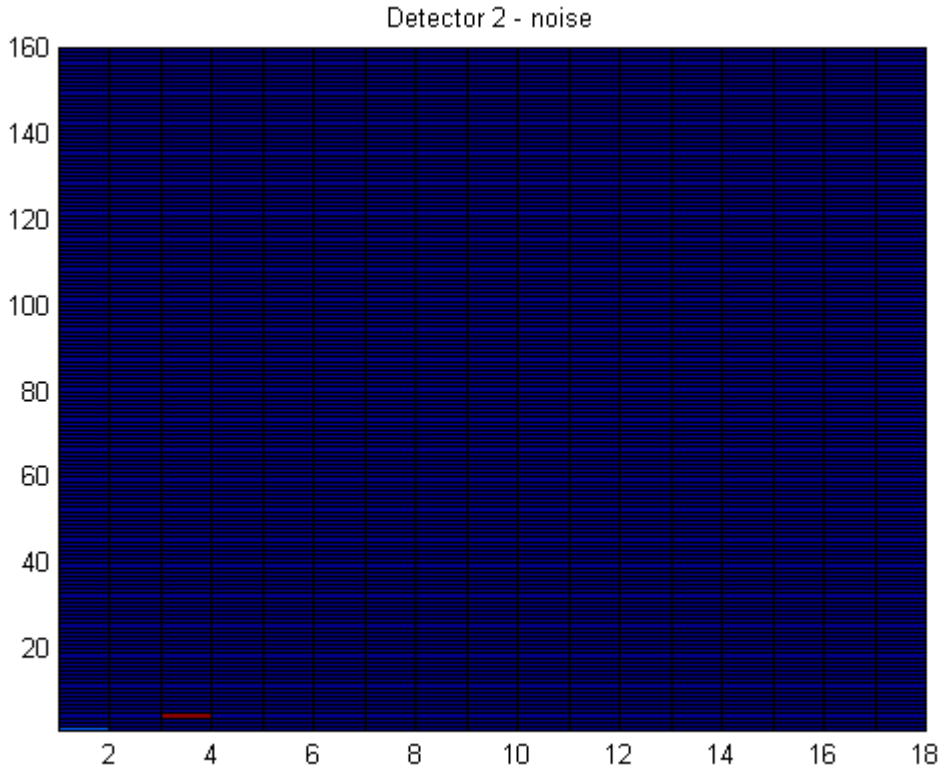
All the tests (noise and source) were performed doing the readout of the chip 10,000 times, using a pattern generator as a trigger. The time interval of this trigger is 968μs.

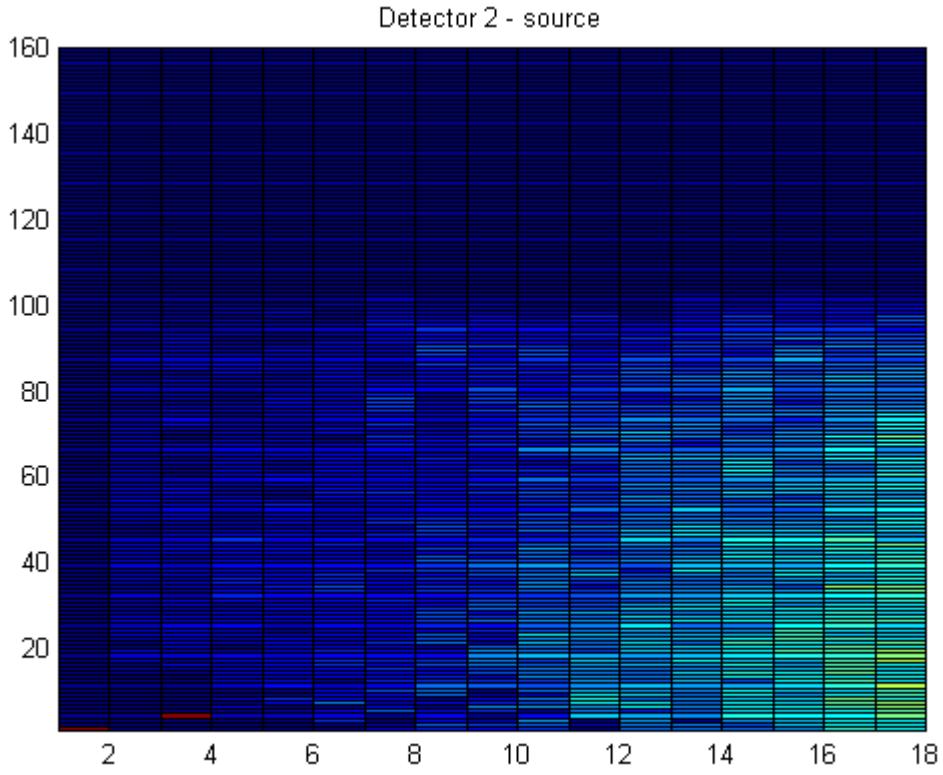
The noise test was done without the injection of any kind in the chip. The inject_charge input was connected to ground using a termination of 50Ω.

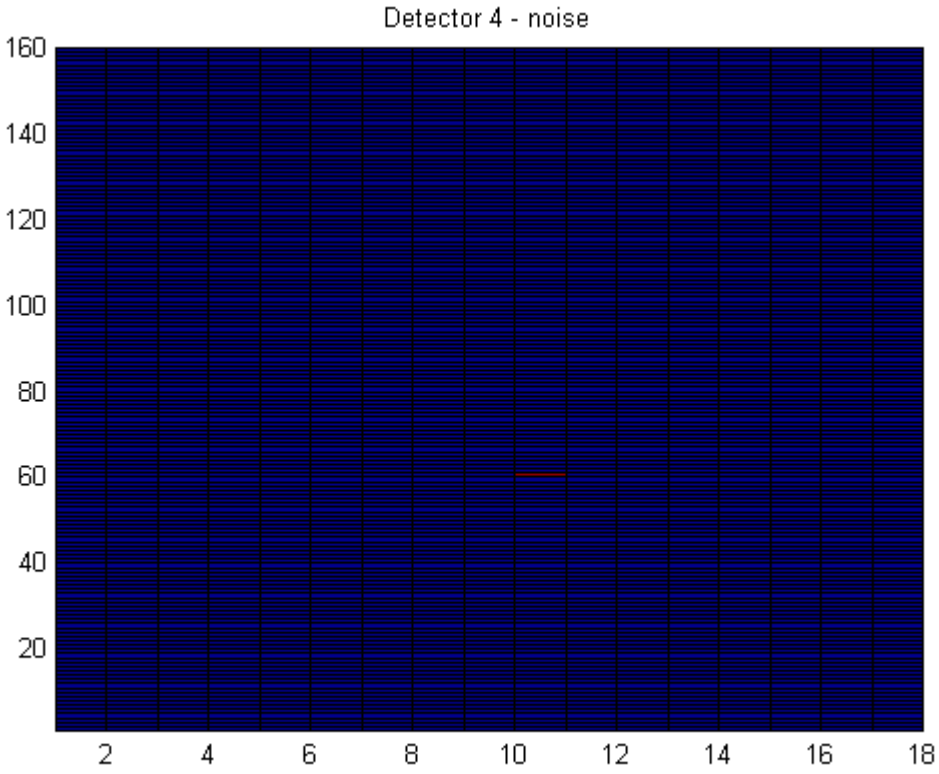
The source test was done with a γ radioactive source about 1.5 cm of the sensor.

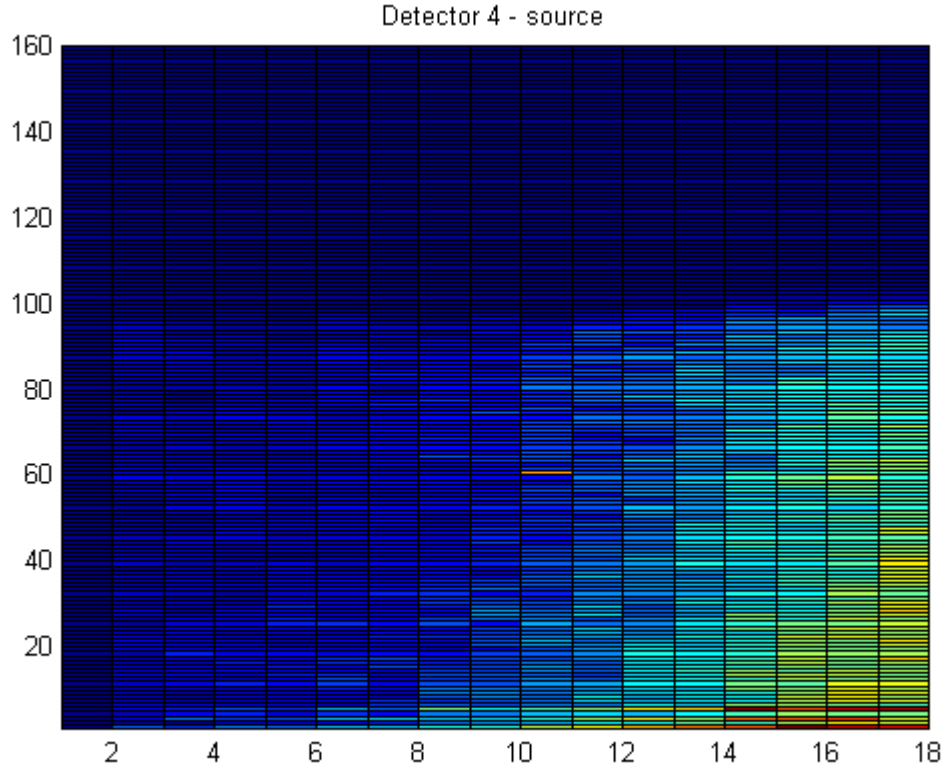

Detector 1 - noise
160
140
120
100
80
60
40
20
2
4
6
8
10
12
14
16
18


Detector 1 - source
160
140
120
100
80
60
40
20
2
4
6
8
10
12
14
16
18


Detector 2 - noise
160
140
120
100
80
60
40
20
2
4
6
8
10
12
14
16
18

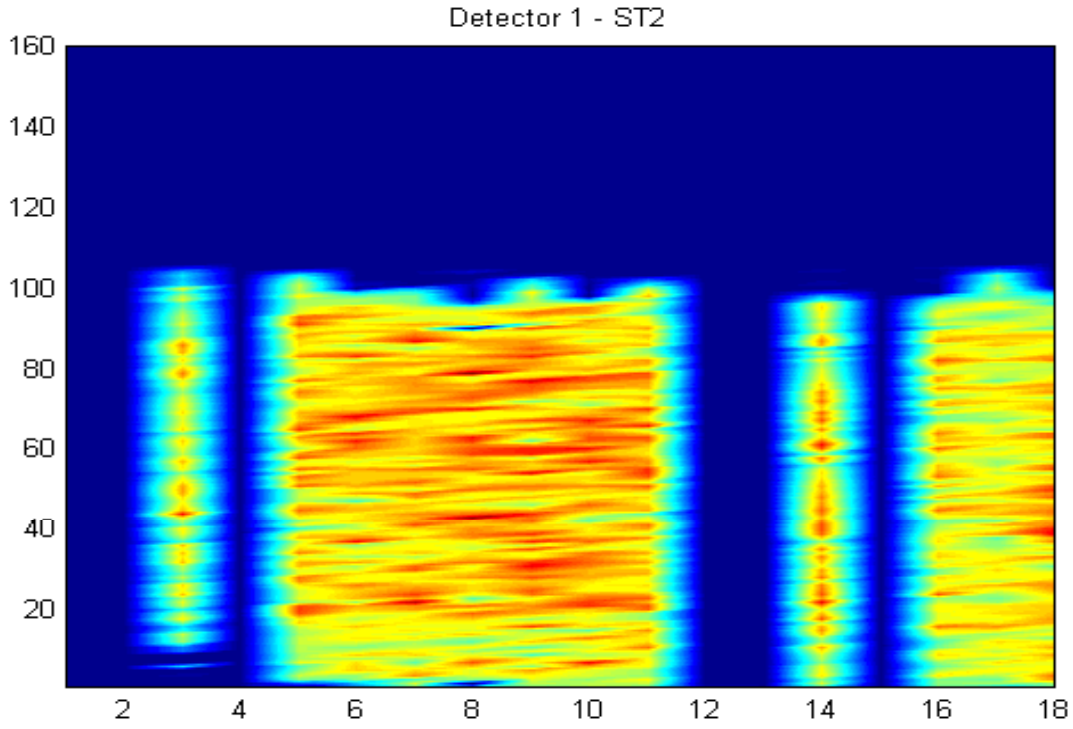

Detector 2 - source
160
140
120
100
80
60
40
20
2
4
6
8
10
12
14
16
18

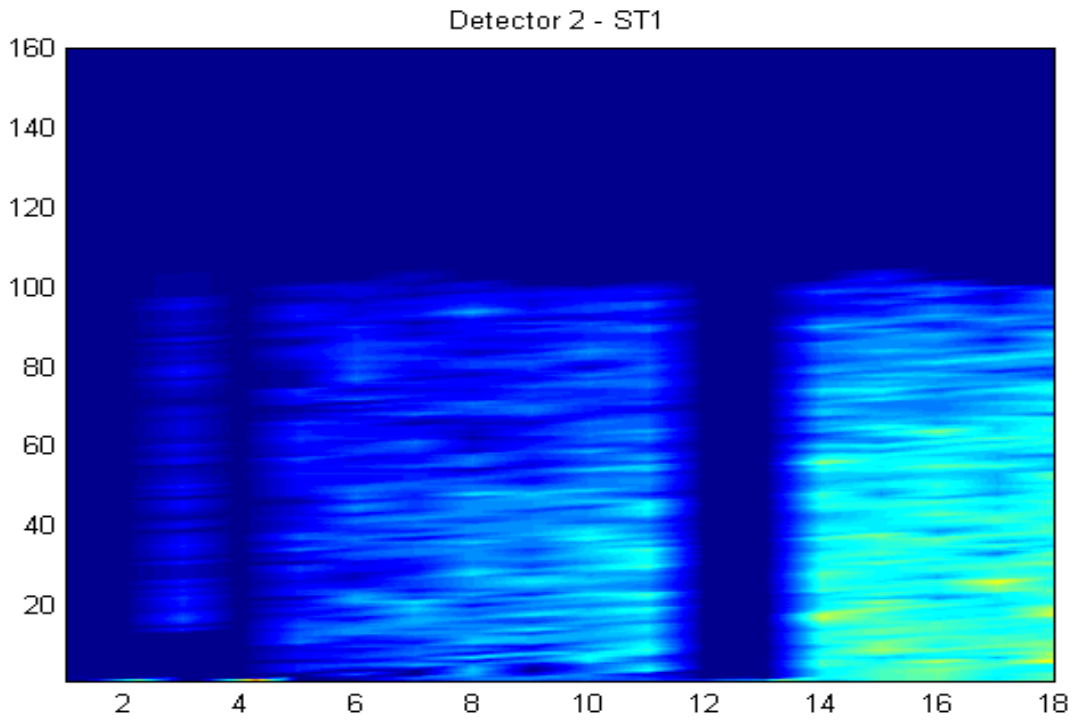

Detector 4 - noise
160
140
120
100
80
60
40
20
2
4
6
8
10
12
14
16
18

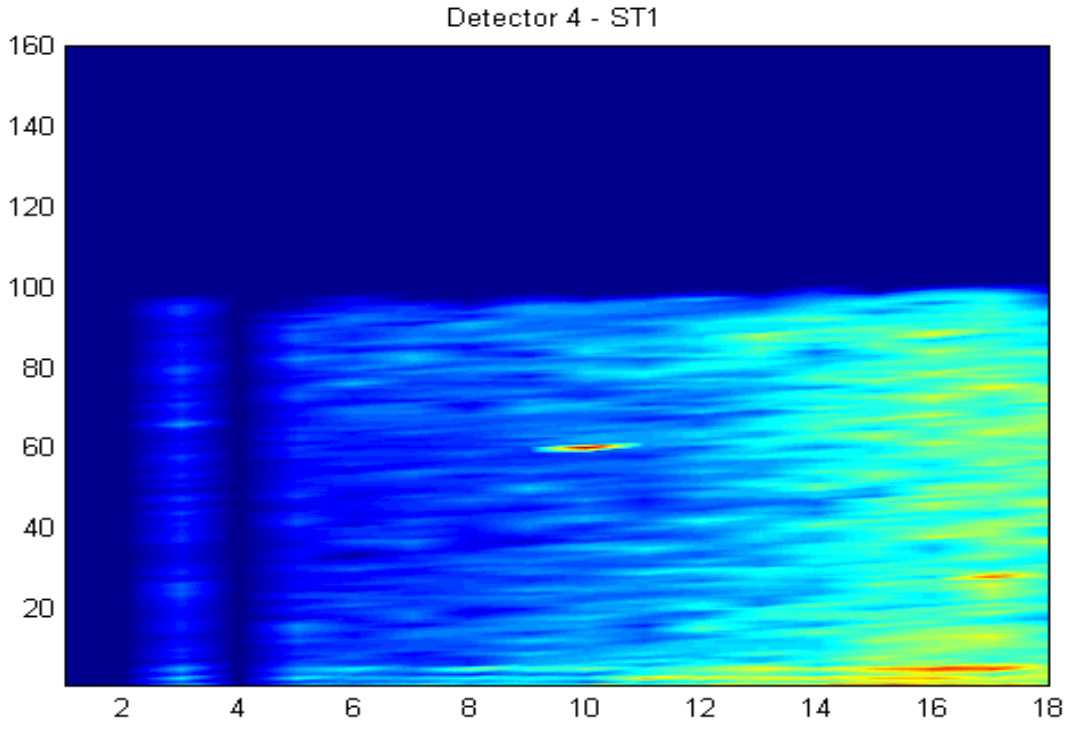

Detector 4 - source
160
140
120
100
80
60
40
20
2
4
6
8
10
12
14
16
18

One very interesting result was find in the beginning of these tests. In this period the chip was not being initialized with the mask registers. By the design it is something that could be done, but the reset of the chip should be enough to leave the chip in a known condition. But the results found show us that the initialization of these mask registers is fundamental to have the chip working properly. If this is not done, some of the columns just don't readout at all.

The following pictures show how the readout looks like when this is the case. The tests were done using the same procedures as explained before, with the same values in the power supplies.




Detector 2 - ST1
160
140
120
100
80
60
40
20
2
4
6
8
10
12
14
16
18


Detector 4 - ST1
160
140
120
100
80
60
40
20
2
4
6
8
10
12
14
16
18